

ABSTRACT

The present invention relates to recombinant
5 human interleukin-3 (hIL-3) variant or mutant proteins
(muteins). These hIL-3 muteins contain amino acid
substitutions and may also have amino acid deletions
at both the N- and C- termini. The invention also
relates to pharmaceutical compositions containing the
10 hIL-3 muteins and methods for using them.
Additionally, the present invention relates to
recombinant expression vectors comprising nucleotide
sequences encoding the hIL-3 muteins, related
microbial expression systems, and processes for making
15 the hIL-3 muteins using the microbial expression
systems.

Included in the present invention are
deletion mutants of hIL-3 in which from 1 to 14 amino
20 acids have been deleted from the N-terminus, and from
1 to 15 amino acids 119 to 133 have been deleted from
the C-terminus, and which also contain amino acid
substitutions in the polypeptide. These hIL-3
multiple mutation polypeptides may have biological
25 activities similar to or better than hIL-3 and, in
some cases, may also have an improved side effect
profile.

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